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Integrating faith and fitness: The role of Salāh in promoting holistic well-being

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Abstract

Salāh, the Islamic ritual prayer, is performed five times daily: Fajr, Zuhr, Asr, Maghrib, and Isha. It is regarded as the central act of worship in Islam and integrates physical postures, recitation, and mindfulness. It is not only a symbolic act of devotion but also contributes to physical health. This study examined the influence of Salāh, as a spiritual and physical practice, on physiological, psychological, and anthropometric measures in boys aged 13–14 years. Sixty participants were randomly assigned to either an experimental group (n = 30) or a control group (n = 30). The experimental group performed Salāh five times daily for six weeks, while the control group received no intervention. Pretest–posttest data were collected for body composition (weight, height, and body mass index), flexibility (sit-and-reach test and Gap test), cardiovascular endurance (Harvard step test), blood pressure, resting heart rate, and cognitive function (Stroop Color and Word Test). The results showed that the experimental group demonstrated significant improvements in flexibility, cardiovascular endurance, systolic and diastolic blood pressure, resting heart rate, and cognitive function, with no significant change observed in body mass index (BMI). These results indicate that regular Salāh practice positively affects cardiovascular health, muscular flexibility, and mental alertness through rhythmic movement, controlled breathing, and focused attention. The spiritual and physical dimensions of Salāh thus offer a natural, culturally grounded approach to enhancing the holistic well-being of youth.

1 Introduction

Religion encompasses more than faith alone; it functions as a system that supports health, harmony, and human well-being (Fisher, 2011). During the COVID-19 pandemic, religious and spiritual behaviors provided psychological resilience, emotional stability, and moral clarity (Menon et al., 2021). Within this context, Salāh, the Islamic ritual prayer, emerges as a structured practice that integrates worship, discipline, and rhythm (Alsuhaymi and Atallah, 2025). The present study investigates how this practice contributes to spiritual development as well as physical, mental, and anthropometric health among adolescents. While previous research has established the mental health benefits and improved cardiovascular fitness associated with physical activity (Calfas and Taylor, 1994; Osama and Malik, 2019), limited attention has been given to spiritual exercise such as Salāh, a prayer ritual that integrates mind, body, and soul. Accordingly, this study conceptualizes Salāh as a potential holistic health practice that bridges sacred and scientific domains, as well as devotional and physiological aspects. Salāh represents the central element of ritual practice in Islam, providing a daily structure for believers and symbolizing ongoing engagement with the divine (Sarkingobir et al., 2022).

Muslim prayers are obligatory five times daily, with each prayer corresponding to specific times determined by the sun's movement. This alignment synchronizes daily human routines with broader cosmic cycles (Sayeed and Prakash, 2013; Kamran, 2018; Menon et al., 2021; Lee-Hood, 2024). The rakaʿah (ركعة) serves as the fundamental unit of Ṣalāh. Each rakaʿah consists of a standardized sequence of bodily postures and movements, accompanied by brief prayers and Qur'anic verses. This sequence includes vocalized recitation during breath-holding, integrating breath control, physical postures, and vocalization into a comprehensive psychophysical practice. The physical motions of Salāh, standing, bowing, prostrating, and

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sitting, establish a rhythmic pattern of breath and mindfulness, exemplifying the integration of physical exercise and spiritual devotion, a concept also present in classical yoga asanas (**Fig. 1**).

During the standing (Qiyām) motion, the worshipper faces the Kaʿbah, a sacred structure located at the center of the Masjid al-Haram in Makkah, Saudi Arabia, which is regarded as the holiest site in Islam and the direction (Qiblah) toward which Muslims pray. The individual maintains an erect posture, straightening the spine and engaging postural muscles. This position promotes equilibrium, poise, and mental alertness, and is analogous to Tāḍāsana (Mountain Pose) in yoga. In the bowing (Rukūʿ) motion, the worshipper bends forward with the back parallel to the ground and hands placed on the knees, thereby stretching the hamstrings and spine, and enhancing flexibility and blood circulation. This movement corresponds to Uttanāsana (Standing Forward Bend) in yoga. The prostration (Sujūd) motion involves placing the forehead, nose, palms, knees, and toes on the ground, symbolizing ultimate humility and submission. This posture facilitates venous blood return, improves brain oxygenation, and induces relaxation, and is comparable to Balāsana (Child's Pose) and Adho Mukha Śvānāsana (Downward-Facing Dog Pose) in yoga. The sitting (Jalsah or Qaʿdah) motion, performed between two prostrations, increases flexibility in the hips and knees and encourages calm breathing. It is similar to Vajrāsana (Thunderbolt Pose), which supports digestion and concentration (İmamoğlu and Dilek, 2016). In the final sitting and salutation (Tashahhud and Tawattur) motion, the worshipper recites the declaration of faith while seated, then turns to the right and left to conclude the prayer, thereby promoting neck mobility and fostering a sense of peace, gratitude, and communal unity (Jariban, 2023; Tottoli, 2023).

Salāh represents a dynamic art of balance, functioning as a sacred choreography that engages the musculoskeletal, circulatory, and nervous systems. It integrates physical vitality and spiritual tranquility, resulting from structured physical training combined with spiritual practice rooted in faith and worship (Sayeed and Prakash, 2013). The present study is based on the premise that Salāh may serve as a natural, culturally accepted form of exercise with the potential to enhance cardiovascular endurance, cognitive processing, and physical flexibility in adolescents. Although Salāh originates from spiritual traditions, it has seldom been examined from biomechanical and psychological perspectives. Therefore, this research investigates Salāh as a holistic, indigenous practice of physical and spiritual activity, and examines the potential effects of its structured and rhythmic movements on cardiovascular health, cognitive processing, and physical flexibility in adolescent males.

Physiological indices, including blood pressure and heart rate variability, were monitored to quantify the extent to which conventional prayer motions improve cardiovascular endurance through regulated breathing and systematic body postures. The study also assessed the impact of Salāh on cognitive functions such as attention, memory, and executive functions,

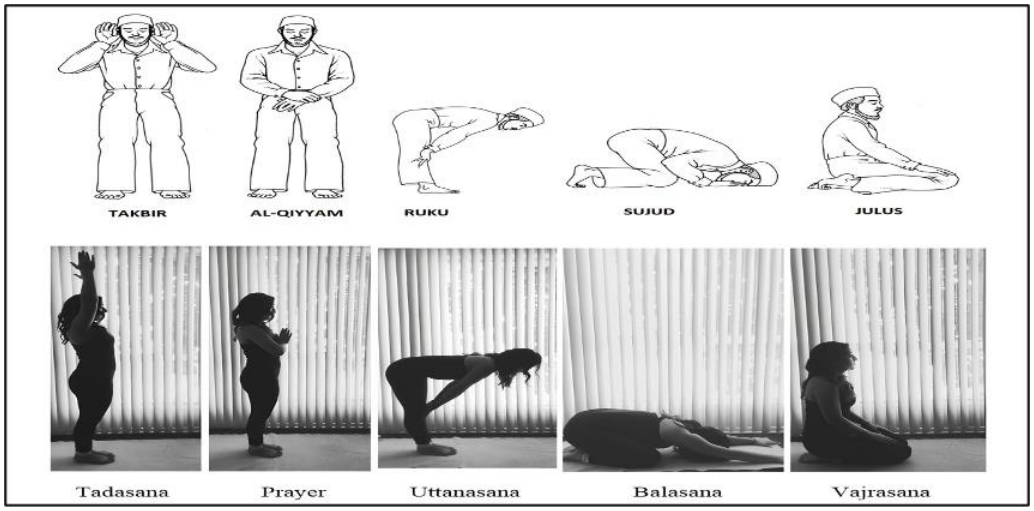

Fig. 1. Different postures of Islamic prayers with integrating yoga asanas.

thereby illustrating how the integration of spirituality and mindfulness may enhance attentional concentration and emotional stability. Furthermore, the influence of repeated postural sequences on joint flexibility, muscle coordination, and overall body balance was examined, reflecting the biomechanical symmetry inherent in this religious practice (Kamran, 2018).

This study aimed to investigate the impact of Salāh on cardiovascular health and cognitive functions among adolescent boys. Specifically, the research examined the effect of daily Salāh on cardiovascular parameters, including blood pressure and heart rate variability. Additionally, the study assessed the influence of Salāh on attention, memory, and executive function, as well as its effect on the range of motion and physical flexibility of body joints.

2 Materials and methods

2.1 Research design

This study employed a quantitative quasi-experimental pretest–posttest control group design to examine the effects of regular Salāh practice on cardiovascular health, cognitive function, and physical flexibility among adolescent boys. The study focused on selected physiological, cognitive, and physical fitness parameters. Participants were assigned to experimental and control groups through randomization within the existing cohort; however, the design was considered quasi-experimental because full randomization at the population level and complete control over extraneous variables were not possible.

The participants underwent a structured six-week intervention involving daily Salāh practice. Baseline (pretest) and post-intervention (posttest) assessments were conducted for both groups to evaluate changes in the selected variables. The experimental group participated in structured Salāh practice, whereas the control group continued their daily routine without any imposed intervention. A total of 60 adolescent boys aged 13–14 years were selected from local schools and equally divided into the experimental and control groups (30 participants each). The inclusion criteria for the study were participants who were physically healthy and able to perform moderate physical activity, and who had regular school attendance. The exclusion criteria included individuals with existing cardiovascular, musculoskeletal, or neurological disorders, those engaged in structured athletic training programs outside school, and those with irregular participation during the intervention period.

This study was conducted at Bhagra Higher Secondary School, located in the Purba Bardhaman District of West Bengal, India. The school serves students from surrounding rural areas and provides an appropriate setting for examining structured physical training among adolescents.

2.2 Choice of variables and measurement tools

The Salāh was practiced at least five times a day for six weeks in each of the physical postures (Qiyam, Ruku, Sujood, and Tashahhud) with spiritual and mental concentration. Among the dependent variables assessed are physiological, cognitive, physical fitness, and anthropometric measures. Physiological measures include resting heart rate, the number of times the heart beats per minute after a resting period, and blood pressure, measured using a digital sphygmomanometer in mmHg as systolic and diastolic pressure. Cardiovascular endurance and recovery were assessed through adaptations of the Harvard step test (Johnson and Nelson, 1969), in which the subject steps up and down on a standardized bench for a set period, while pulse rates during recovery are recorded to determine the physical efficiency index (PEI). Cognitive performance, particularly attention, concentration, and cognitive control (executive functions), was evaluated using the Stroop Color Word Test (Golden et al., 1978), in which participants name the ink color of printed words rather than read them, to assess selective attention and resistance to distraction.

Physical fitness measures included lower-body flexibility, assessed through the sit-and-reach test (Riebe et al., 2018), in which the participant sits with legs extended and reaches forward along a ruler to the maximum possible distance to evaluate hamstring and lower back flexibility. Upper-body flexibility and shoulder joint range of motion were evaluated using the shoulder overlap or Gap test (Rikli and Jones, 2013), where one hand reaches over the

shoulder, and the other behind the back, and the distance between fingertips is measured. Anthropometric measures, including height (m), weight (kg), and body mass index (BMI; kg/m²), were also recorded. All tools used in the study are standardized and widely validated in physical education and psychological research.

2.3 Intervention protocol

The intervention included a six-week program of regular Islamic prayer. Participants performed the prayer five times daily. This study adopted a comprehensive approach by educating participants about the significance of regular prayer and its relationship to health. The Salāh was performed according to the traditional Islamic guidelines, which include: the Fajr prayer consisting of 4 rakats performed in the morning, the Zuhr prayer consisting of 12 rakats performed in the afternoon, the Asar prayer consisting of 8 rakats performed in the evening, the Maghrib prayer consisting of 5 rakats performed just after sunset, and the Isha prayer consisting of 17 rakats performed at night (Aldbyani, 2025).

Participants were required to perform the Islamic prayer at least five times per day for the duration of the six-week study period. Participants were given prayer timetables and guided by the researcher and religious teachers.

2.4 Study procedures

Pretest measurements were conducted one week prior to the intervention, and posttest measurements were taken immediately after completion of the six-week intervention period. All assessments were conducted under standardized conditions by trained personnel to ensure consistency and reliability of data collection. To improve internal validity, several potential confounding variables were assessed and controlled to the extent possible. All participants were recruited from the same school, resulting in relatively similar daily schedules, and socio-cultural backgrounds. The intervention duration, testing environment, and assessment procedures were kept consistent for both groups, and all tests were conducted at approximately the same time of day to minimize circadian influences. Participants were also instructed not to engage in any additional organized physical training during the study period. Although dietary intake and sleep patterns were not controlled, they were expected to remain relatively similar between groups due to the shared living and educational environment of the participants.

Despite these controls, the study had certain methodological limitations. The intervention period was relatively short (six weeks), the sample size was limited (n = 60), and only male adolescents from a single school were included in the study. In addition, lifestyle-related confounding variables could only be partially controlled. Therefore, the findings should be interpreted with caution, and causal inferences should be made conservatively.

2.5 Statistical analysis

Pretest–posttest paired sample t-tests were performed to assess within-group differences between pretest and posttest results, while independent sample t-tests were used to compare the pretest and posttest mean values between the experimental and control groups. To improve statistical rigor, effect sizes (Cohen's d) were calculated to determine the magnitude of observed differences, and 95% confidence intervals (CI) were reported for key outcome variables. The level of significance was set at $p < 0.05$. Prior to analysis, all statistical assumptions, including normality and homogeneity of variance, were checked to ensure the appropriateness of the tests used.

3 Results

3.1 Weight, height and body mass index

The mean, median, standard deviation (SD), and standard error (SE) of weight, height, and BMI of the experimental and control groups in the pretest and posttest periods are shown in **Table 1**. For the experimental group, mean body weight increased slightly from 39.11 ± 7.02 kg at

pretest to 39.86 ± 6.9 kg at posttest. Mean height was 1.49 ± 0.07 m in both testing sessions. Similarly, BMI increased slightly from 17.39 ± 2.57 to 17.68 ± 2.57. The mean body weight of the control group was slightly increased from 38.48 ± 6.88 kg to 38.52 ± 6.91 kg. Height (1.47 ± 0.09) was unchanged, and BMI increased slightly from 17.64 ± 2.57 to 17.67 ± 2.57. Median values showed a similar trend to mean values for both groups. The SD and SE values were similar between pretest and posttest data, suggesting that the samples were homogeneous and consistent in measurements.

3.2 Sit-and-reach test

The results of the sit-and-reach test for the experimental and control groups are shown in **Table 2**. An improvement was observed in the experimental group, with the mean sit-and-reach score increases from 23.67 cm at the pretest to 27.13 cm at the posttest. The median value also increases from 23.5 cm to 26.5 cm. By comparison, the control group had a less pronounced changed, namely an increase in the mean from 22.75 cm to 23.8 cm and in the median from 21.25 cm to 22.5 cm. The SD and SE values decreased between pretest and posttest for the experimental group (SD = 5.39 and 4.01; SE = 0.99 and 0.74, respectively), suggesting less variability and more consistent post-intervention performance. The SD and SE values in the control group were consistent across the two testing sessions. The descriptive results show that flexibility in the experimental group improved more than in the control group.

3.3 Gap test

The descriptive statistics of the Gap test are shown in **Table 3** for the experimental and control groups. The experimental group showed an increase in mean score from the pretest (10.75 cm) to the posttest (14.35 cm). The median has further increased to 12 cm from 10.5 cm. Conversely, the mean score in the control group increased marginally, from 11.56 cm to 11.86 cm, and the median scores increased slightly from 11 cm to 11.25 cm. While the SD in the experimental group increased marginally from 3.37 to 3.58, the SE decreased from 0.99 to 0.74, indicating greater measurement accuracy at posttest. Both SD and SE in the control group remained constant through the testing periods. The descriptive statistics indicate that the experimental group achieved greater gains in lower-body flexibility than the control group.

Table 1. Descriptive statistics of weight, height and BMI of experimental (exp) and control (con) groups during pre- and post-test.

Parameter	Test	Mean		Median		Standard deviation		Standard error	
		Exp	Con	Exp	Con	Exp	Con	Exp	Con
Weight (kg)	Pre	39.11	38.48	39.25	38.7	7.02	6.88	1.28	1.26
	Post	39.86	38.52	38.7	38.9	6.9	6.91	1.26	1.26
Height (m)	Pre	1.49	1.47	1.48	1.47	0.07	0.09	0.01	0.02
	Post	1.49	1.47	1.48	1.47	0.07	0.09	0.01	0.02
BMI (kg/m^2)	Pre	17.39	17.64	17.18	17.21	2.57	2.4	0.47	0.44
	Post	17.68	17.67	17.49	17.24	2.57	2.4	0.47	0.44

Table 2. Descriptive statistics of sit-and-reach test of experimental (exp) and control (con) groups.

Test	Type	Mean		Median		Standard deviation		Standard error	
		Exp	Con	Exp	Con	Exp	Con	Exp	Con
Sit-and-reach test (cm)	Pre	23.67	22.75	23.5	21.25	5.39	5.63	0.99	1.03
	Post	27.13	23.8	26.5	22.5	4.01	5.07	0.74	0.93

Table 3. Descriptive statistics of Gap test of experimental (exp) and control (con) groups.

Test	Type	Mean		Median		Standard deviation		Standard error	
		Exp	Con	Exp	Con	Exp	Con	Exp	Con
Gap test (cm)	Pre	10.75	11.56	10.5	11	3.37	3.25	0.99	0.66
	Post	14.35	11.86	12	11.25	3.58	3.44	0.74	0.65

3.4 Harvard step test

The means and SDs of the Harvard step test for the experimental and control groups are presented in **Table 4**. The experimental group showed an increase in the mean score after the posttest (87.41) compared to the pretest (79.49). The median value also increased from 80.35 to 89.2. Though the posttest SD increased from 3.98 to 6.75, the SEs were 1.23 and 0.73, respectively, reflecting measurement precision. The control group, however, showed little change with mean scores of 79.07 and 79 at pretest and posttest, respectively. The median values were 80.35 and 80, respectively, with negligible differences in SD and SE.

A posttest intergroup comparison indicated a greater mean in the experimental group (87.41) than the control group (79). The calculated t-value of 5.88 and p-value of 0.001 suggest that the difference between the two groups is statistically significant. The result showed a higher increase in cardiovascular endurance in the experimental group than in the control group.

3.5 Stroop test

The descriptive statistics of the Stroop test for the control and experimental groups are shown in **Table 5**. The mean score for the experimental group increased from 27.43 at the pretest to 31.63 at the posttest. The median also increased from 27.5 to 31.5. Furthermore, the SD decreased from 5.59 to 4.98, and the SE decreased from 1.02 to 0.91, suggesting lower variance and more stable performance in the posttest. The mean score of the control group, conversely, decreased a little from 28.3 to 27.5. The median value changed from 28 to 27.5. The SD increased from 5.21 to 5.79, and the SE increased from 0.95 to 1.06, suggesting greater variability in posttest performance.

Table 4. Descriptive statistics of Harvard step test of experimental (exp) and control (con) groups.

Test	Type	Mean		Median		Standard deviation		Standard error	
		Exp	Con	Exp	Con	Exp	Con	Exp	Con
Harvard step test (cm)	Pre	79.49	79.07	80.35	80.35	3.98	3.94	0.73	0.72
	Post	87.41	79	89.2	80	6.75	3.97	1.23	0.73

Table 5. Descriptive statistics on psychological variables of experimental (exp) and control (con) groups (pre and post Stroop test).

Test	Type	Mean		Median		Standard deviation		Standard error	
		Exp	Con	Exp	Con	Exp	Con	Exp	Con
Stroop test	Pre	27.43	28.3	27.5	28	5.59	5.21	1.02	0.95
	Post	31.63	27.5	31.5	27.5	4.98	5.79	0.91	1.06

Posttest analysis revealed that the experimental group (31.63) had a significantly higher mean than the control group (27.5). The t-value obtained (2.99), and its p-value (0.004) suggest a statistically significant difference between the groups. The results show that the experimental group's cognitive performance was better than that of the control group.

3.6 Blood pressure

Descriptive statistics for systolic and diastolic blood pressure for the experimental and control groups are listed in **Table 6**. Systolic blood pressure in the experimental group was significantly decreased, with the average systolic blood pressure at pretest (119.9 mmHg) decreasing to 114 mmHg at posttest. The median values decreased from 119.5 mmHg to 113.5 mmHg. Conversely, the control group experienced a minimal increase, from 119 mmHg to 120.1 mmHg, as median values were stable (119.5 mmHg during both testing periods).

The comparison between the groups after posttest revealed a lower systolic mean arterial pressure in the experimental group (114 mmHg) than in the control group (120.1 mmHg). A t-value of 2.6 and a p-value of 0.010 suggest that the difference between groups was significant. The SD and SE values were similar across both testing periods, indicating measurement stability. The experimental group exhibited a decrease in mean diastolic blood pressure from 79 mmHg at the pretest to 73.77 mmHg at the posttest, with median values of 68 and 73 mmHg, respectively. The mean diastolic blood pressure in the control group increased slightly from 75.57 mmHg to 77.47 mmHg, with median values of 76.5 and 76 mmHg, respectively. Posttest comparison also showed a significant difference between the groups ($t = 2.22$, $p = 0.03$), favoring the experimental group with lower diastolic pressure. The values of SD and SE indicated sufficient measurement precision.

3.7 Resting heart rate

The descriptive statistics of resting heart rate conditions are shown in **Table 7**. The experimental group participants showed a reduction in mean heart rate from 80.93 bpm in the pretest to 75.9 bpm in the posttest. Median values fell from 81 bpm to 76 bpm. Although SD modestly increased from 3.7 to 4.19, SE was still small (0.67 to 0.76), suggesting satisfactory

Table 6. Descriptive statistics of systolic and diastolic blood pressure in experimental (exp) and control (con) groups.

Test	Type	Mean		Median		Standard deviation		Standard error	
		Exp	Con	Exp	Con	Exp	Con	Exp	Con
Systolic BP (mmHg)	Pre	119.9	119	119.5	119.5	8.9	8.9	1.63	1.63
	Post	114	120.1	113.5	119.5	8.9	8.87	1.57	1.62
Diastolic BP (mmHg)	Pre	79	75.57	68	76.5	8.06	6.75	1.47	1.23
	Post	73.77	77.47	73	76	7.3	5.53	1.33	1.01

Table 7. Descriptive statistics of resting heart rate in experimental (exp) and control (con) groups.

Test	Type	Mean		Median		Standard deviation		Standard error	
		Exp	Con	Exp	Con	Exp	Con	Exp	Con
Heart rate (bpm)	Pre	80.93	80	81	80	3.7	3.07	0.67	0.56
	Post	75.9	80.88	76	81	4.19	3.70	0.76	0.67

measurement reliability. The mean heart rate of the control participants increased marginally from 80 bpm to 80.88 bpm, while the median values were 80 bpm and 81 bpm, respectively. The comparison between the two groups after the intervention showed a significant difference ($t = 4.94$, $p \leq 0.001$), with the experimental group showing a lower resting heart rate. These results showed that cardiovascular parameters improved in the experimental group compared to the control group.

4 Discussion

4.1 Effects of Salāh on personal, physiological, and psychological variables

The comparison between the experimental and control groups strongly suggested that Salāh did not significantly affect height or BMI. Height remained unchanged in both study groups, as expected for a short intervention period. Although the experimental group showed a marginal increase in mean weight and BMI from pretest to posttest, no statistically significant difference was observed between the groups at posttest. These findings suggest that Salāh may not substantially alter body composition in the short term, but it may contribute to physical stability during adolescence. In contrast, the experimental group demonstrated improvements in physiological variables. Flexibility, assessed through the sit-and-reach test, significantly increased in the experimental group, whereas the control group showed only minor variation. These improvements may be attributed to the repeated postural movements involved in Salāh, such as bowing (rukūʿ), prostration (sujūd), and sitting (jalsah), which enhance joint mobility and muscle extensibility. Cardiovascular endurance, as estimated by the Harvard step test, was also significantly higher in the posttest of the experimental group than in the control group ($p = 0.001$). This finding indicates improved aerobic efficiency and recovery from moderate-intensity exercise, likely due to the regular physical activity required for Salāh. Similarly, the experimental group showed a significant decline in resting heart rate, reflecting improved cardiac efficiency. Systolic and diastolic blood pressure were also significantly declined compared with the control group. These results indicate that Salāh functions as a low-intensity rhythmic exercise that promotes autonomic balance, reduces stress, and improves circulatory regulation.

The Stroop test revealed significant improvements in attention, mental flexibility, and executive control in the experimental group, whereas the control group experienced slight deterioration. The focused attention, rhythmic breathing, and systematic movements involved in Salāh may enhance cognitive control, concentration, and mental clarity. These findings are consistent with previous research suggesting that mind-body interventions positively influence executive functioning and psychological well-being (Chen et al., 2017; Eayaz et al., 2025). Overall, the findings demonstrate that daily Salāh can be regarded as a holistic health-promoting activity that positively influences flexibility, cardiovascular endurance, blood pressure regulation, heart rate, and cognitive processing, while having minimal impact on personal variables such as BMI and height (Eman and Rao, 2025). The absence of meaningful anthropometric changes suggests that Salāh exerts greater influence on functional and physiological health than on structural body composition.

4.2 Effects of Salāh on cardiovascular health, cognitive function and flexibility in adolescents

Previous empirical evidence indicates that several low-intensity, moderate physical activities involving rhythmic breathing and movement can improve specific cardiovascular outcomes (Shao et al., 2024). Radtke et al. (2013) reported that a history of physical activities was positively associated with lower resting heart rate and blood pressure, as well as higher aerobic capacity in adolescents. Similarly, Osama and Malik (2019) observed that a structured physical training regimen resulted in positive cardiovascular modifications in young individuals. Furthermore, performing Salāh five times daily for six weeks produced significant reductions in systolic and diastolic blood pressure and resting heart rate in the experimental group compared to controls, supporting the view that a culturally practiced, non-demanding

movement activity can enhance cardiovascular measures in young males (Calfas and Taylor, 1994; Osama and Malik, 2019).

Research on structured physical activity and cognitive functioning in young people demonstrates benefits for attention, processing speed, and executive control, among other cognitive domains, following exercise (Osama and Malik, 2019). Additionally, mind-body interventions involving focused attention, breath control, and slow movement, such as mindfulness or low-intensity meditative movements, have been reported to improve cognitive function by enhancing attentional control and reducing oxidative stress (Hooi et al., 2025). The experimental group exhibited a significant increase on the Stroop test post-intervention and a trend toward significance on the reverse Stroop test. The lack of improvement in the control group, which compromised blinding, suggests that regular Salāh may enhance cognitive performance in youth.

Biomechanical and motion analyses of Salāh indicate that standing, bowing, prostration, and sitting mobilize multiple joints and muscles, contributing to flexibility, balance, and neuromuscular coordination (Safee, 2012; Sayeed and Prakash, 2013). Experimental participants achieved significantly higher scores on the sit-and-reach and Gap (shoulder/hand) tests compared to the control group. These findings align with biomechanical evidence and previous reports that repetitive, fixed postures in Salāh increase joint mobility and muscular flexibility, supporting the conclusion that Salāh practice enhances flexibility.

While both the current intervention and previous studies demonstrate improvements, certain indicators, such as BMI or body composition, may take longer to change significantly (Srivastav et al., 2021). It is therefore important to assess whether practicing Salāh produces meaningful changes in specific physiological or cognitive measures. Short interventions or low-intensity routines may not influence some outcomes, such as BMI, within brief timeframes. This approach also enables rigorous statistical analyses to determine which measures are affected. The six-week data reveal positive effects on cardiovascular, flexibility, and cognitive tests, but not on BMI, highlighting areas where effects may be absent or delayed.

4.3 Study Implications

The findings of this study suggest that Salāh constitutes a culturally sensitive form of natural physical exercise. The documented improvements in cardiovascular endurance, flexibility, and cognitive performance indicate that faith-based physical practices can promote holistic well-being by integrating body, mind, and spirit (Eman and Rao, 2025). In educational contexts that prioritize cultural inclusivity, incorporating structured, rhythmic, and meditative movements into school health or physical education curricula may enhance mindfulness, discipline, self-regulation, stress management, and value-based learning. Therefore, this study highlights the potential importance of integrating spiritual and physical education to cultivate healthier and more ethically grounded individuals.

4.4 Limitations

The study sample consisted primarily of adolescent males aged 13–14 years from a single rural school, which may restrict the generalizability of the findings to wider populations. Furthermore, the six-week interventions are relatively brief, and changes in variables such as body composition may not become apparent for some time. The reliance on field-based assessments rather than laboratory-based measurements may also have affected the precision of specific outcomes.

Future research should examine more diverse populations, including individuals of varying age groups, genders, and sociocultural backgrounds, while utilizing larger sample sizes and extended intervention periods. Incorporating neurocognitive, physiological, and hormonal markers may offer a more comprehensive understanding of the psychophysiological effects of Salāh over time. These investigations would enhance the evidence base concerning the role of faith-based physical practices in promoting holistic health and educational development

5 Conclusion

The study demonstrates that regular practice of Salāh significantly enhances cardiovascular endurance, flexibility, and cognitive performance, while reducing resting heart rate and blood pressure among adolescent boys. Although no significant difference in BMI was observed, the overall improvements in physical and psychological well-being suggest that Salāh functions as a holistic exercise for physical, mental, and spiritual health. Incorporating culturally sensitive practices, such as Salāh, into school physical education programs may offer a simple, cost-effective approach to improving adolescent health and well-being.

6 Ethical statements

Ethical clearance was obtained from the Institutional Ethics Committee of The University of Burdwan prior to data collection. As the study involved children, written informed consent was obtained from parents or guardians, and assent was obtained from the children. Anonymity and confidentiality of participant data were maintained throughout the study. Participants were informed of their right to withdraw from the study at any time without penalty. The study adhered to the ethical standards of the relevant national and institutional committees for human research.

7 Conflict of interest

The authors declare no potential conflicts of interest in respect of the research, authorship and publication of this article.

8 Data availability statement

The data are available from the corresponding author upon reasonable request.

9 Author contributions

G.S. Roy: Conceptualization, formal analysis, investigation, and writing – original draft. K.C. Mandal: Resources, and writing – review & editing. N. Afroja: Conceptualization, investigation, and writing – review & editing. C. Adhikary: Resources, and writing – review & editing. All authors reviewed and approved the final version of the manuscript.

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